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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/761,101

01/20/2004

David R. Loveday

1999U026.RE.US

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25959 7590 06/24/2008  
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EXAMINER

CHEUNG, WILLIAM K

ART UNIT

PAPER NUMBER

1796

MAIL DATE

DELIVERY MODE

06/24/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/761,101	<b>Applicant(s)</b> LOVEDAY ET AL.	
	<b>Examiner</b> WILLIAM K. CHEUNG	<b>Art Unit</b> 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 08 April 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1, 7-10, 12, 15, 17, 19-21 and 49 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 7-10, 12, 15, 17, 19-21, 49 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

1. In view of the amendment filed April 8, 2008, claims 2-6, 11, 13-14, 16, 18, 22-48 have been cancelled, and new claim 49 has been added. Claims 1, 7-10, 12, 15, 17, 19-21, 49 are pending.

2. In view of the cancellation of claim 2, the rejection of Claim 2 under 35 U.S.C. 112, second paragraph, is withdrawn.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1, 7-10, 12, 15, 17, 19-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 (line 24), the recitation "alkyl" is considered indefinite because according to the chemical structure of claim 1 (line 17), R<sup>1</sup> and R<sup>2</sup> must be an alkylene group, not an alkyl group. Can R<sup>1</sup> and R<sup>2</sup> be an alkyl group and still form the chemical structure recited?

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

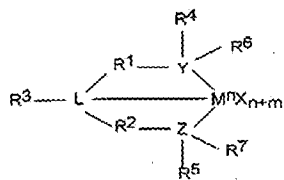
(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

6. Claims 1, 7-10, 12, 15, 17, 19-21, 49 are rejected under 35 U.S.C. 102(b) as being anticipated by Sugimura et al. (JP 10-330412), English translated.

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1. (Currently Amended) A process for polymerizing olefin(s) comprising, combining said olefin(s), a catalyst composition having a first catalyst [system] component comprising a Group 15 containing [bidentate or] tridentate ligated Group 3 to 7 metal compound wherein the Group 3 to 7 metal atom is bound to at least one leaving group and to [at least two] three Group 15 atoms, and wherein [at least one of the at least] two of the Group 15 atoms [is bound to a group 15 or 16 atom] are each bound to the third Group 15 atom through a bridging group; and a second catalyst [system] component,  
wherein said second catalyst component is a metallocene compound;  
wherein said first catalyst component and said second catalyst component are added to a polymerization reactor in one of a solution, a suspension or an emulsion;  
wherein the polymerization process is a continuous gas or slurry phase process, and  
wherein the Group 15 containing tridentate ligated hafnium catalyst compound is represented by the formula:



Formula (I)

wherein M is a Group 3 to 7 metal;  
each X is independently a leaving group;  
n is the oxidation state of M;

m is the formal charge of the Y, Z and L ligand;

L is a Group 15 element;

Y is a Group 15 element;

Z is a Group 15 element;

R<sup>1</sup> and R<sup>2</sup> are independently a linear, branched, or cyclic C<sub>2</sub> to C<sub>30</sub> alkyl group;

R<sup>3</sup> is a hydrocarbon group, hydrogen, a halogen, or a heteroatom containing group;

R<sup>4</sup> and R<sup>5</sup> are independently an alkyl group, an aryl group, substituted aryl group, a cyclic alkyl group, a substituted cyclic alkyl group, a cyclic arylalkyl group, a substituted cyclic arylalkyl group or multiple ring system;

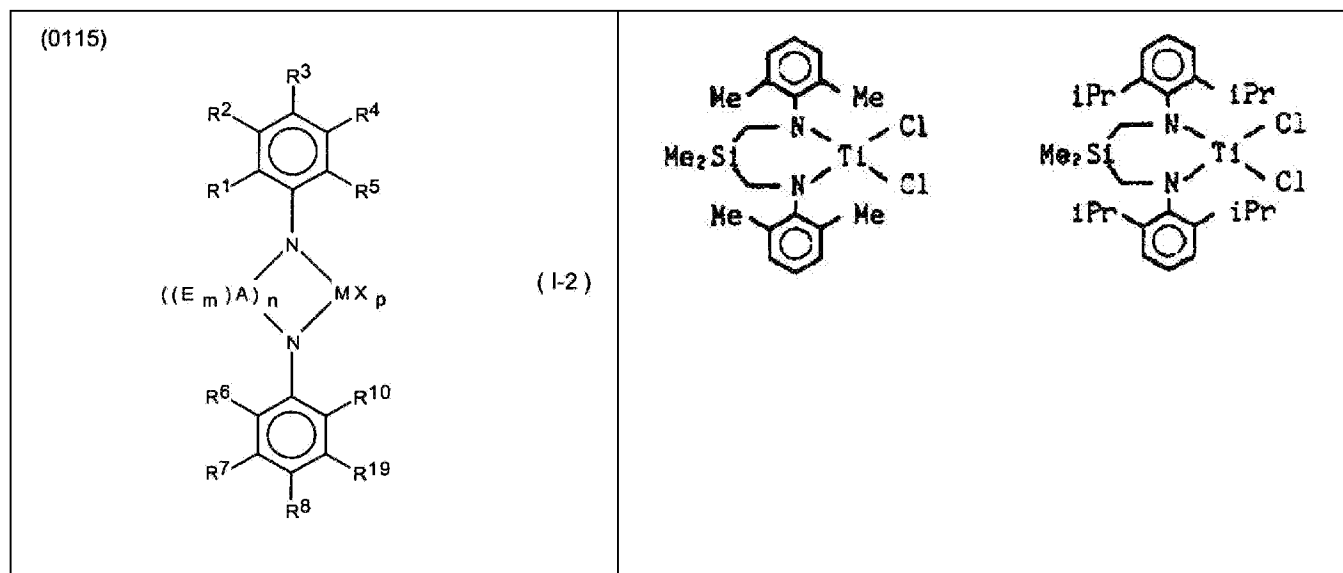
R<sup>1</sup> and R<sup>2</sup> may be interconnected to each other, and/or R<sup>4</sup> and R<sup>5</sup> may be interconnected to each other, and

R<sup>6</sup> and R<sup>7</sup> are independently absent, or hydrogen, an alkyl group, halogen, heteroatom or a hydrocarbyl group.

Sugimura et al. (page 4, claim 1) disclose a catalyst substantially identical to the catalyst as claimed. Sugimura et al. (page 14, 0034) clearly disclose a metallocene catalyst comprising a Group 4 metal. Regarding the ratio of the components, Sugimura

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et al. (page 67, 0201-0202) clearly teach the molar ratios ranging from 0.02 to 100, preferably from 0.05 to 50, and the ratios of transition metal atoms in components A and B ranging from 0.01 to 5000, preferably from 0.05 to 2000. Further, Sugimura et al. (page 66, 0199) disclose a polymerization process comprising olefins and the catalyst described. Sugimura et al. (page 66, 0200) disclose that the polymerization process is a solution or suspension polymerization process. Since Sugimura et al. contain all the features of claims 1, 7-10, 12, 15, 17, 19-21, 49, claims 1, 7-10, 12, 15, 17, 19-21, 49 are anticipated.

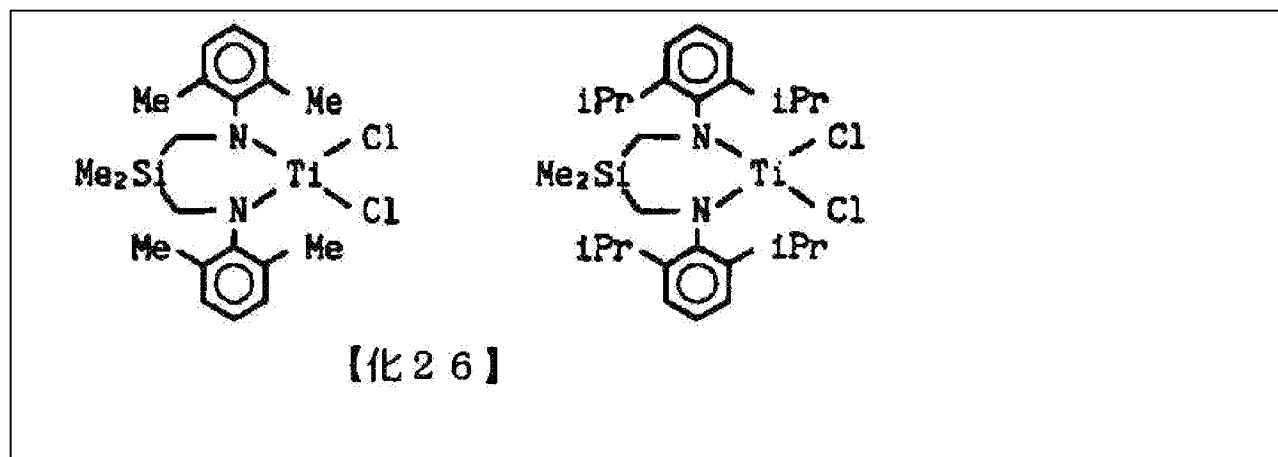


Regarding the hafnium catalyst of claim 49, applicants must recognize that Sugimura et al. (JP 10-330412, page 32, 0092-0094; page 38, 0115-0118) clearly teach catalysts that include hafnium where  $R^1$ - $R^{10}$  can be hydrogen or hydrocarbyl groups. According to Sugimura et al. (JP 10-330412, page 38, 49),  $R^1$ - $R^{10}$  can include hydrogen, methyl and propyl groups.

7. Claims 1, 7-10, 12, 15, 17, 19-21, 49 are rejected under 35 U.S.C. 102(b) as being anticipated by Sugimura et al. (JP 10-330416).

Sugimura et al. (page 9, 0067) disclose a catalyst substantially identical to the catalyst as claimed. Further, Sugimura et al. (page 28, 0172) disclose that the polymerization process is a solution or suspension polymerization process. Since Sugimura et al. contain all the features of claims 1, 7-10, 12, 15, 17, 19-21, 49, claims 1, 7-10, 12, 15, 17, 19-21, 49 are anticipated.

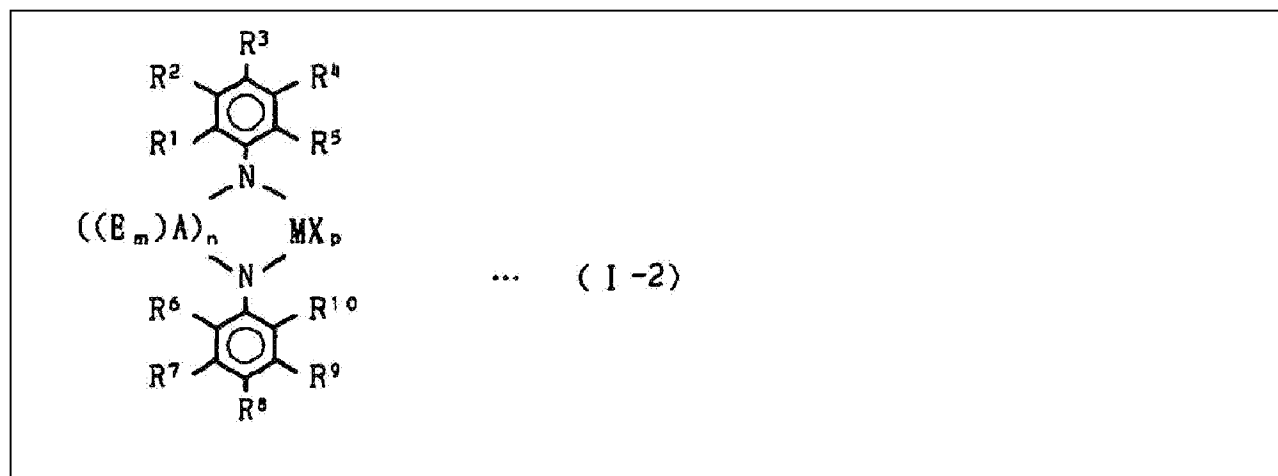
Regarding the hafnium catalyst of claim 49, applicants must recognize that Sugimura et al. (JP 10-330416, page 21, line 4) clearly teach catalysts as follow.



According to Sugimura et al. (JP 10-330416, page 12, 0088 to 0090, page 21, line 4) clearly a catalyst where an alkylene group can be present between A and the

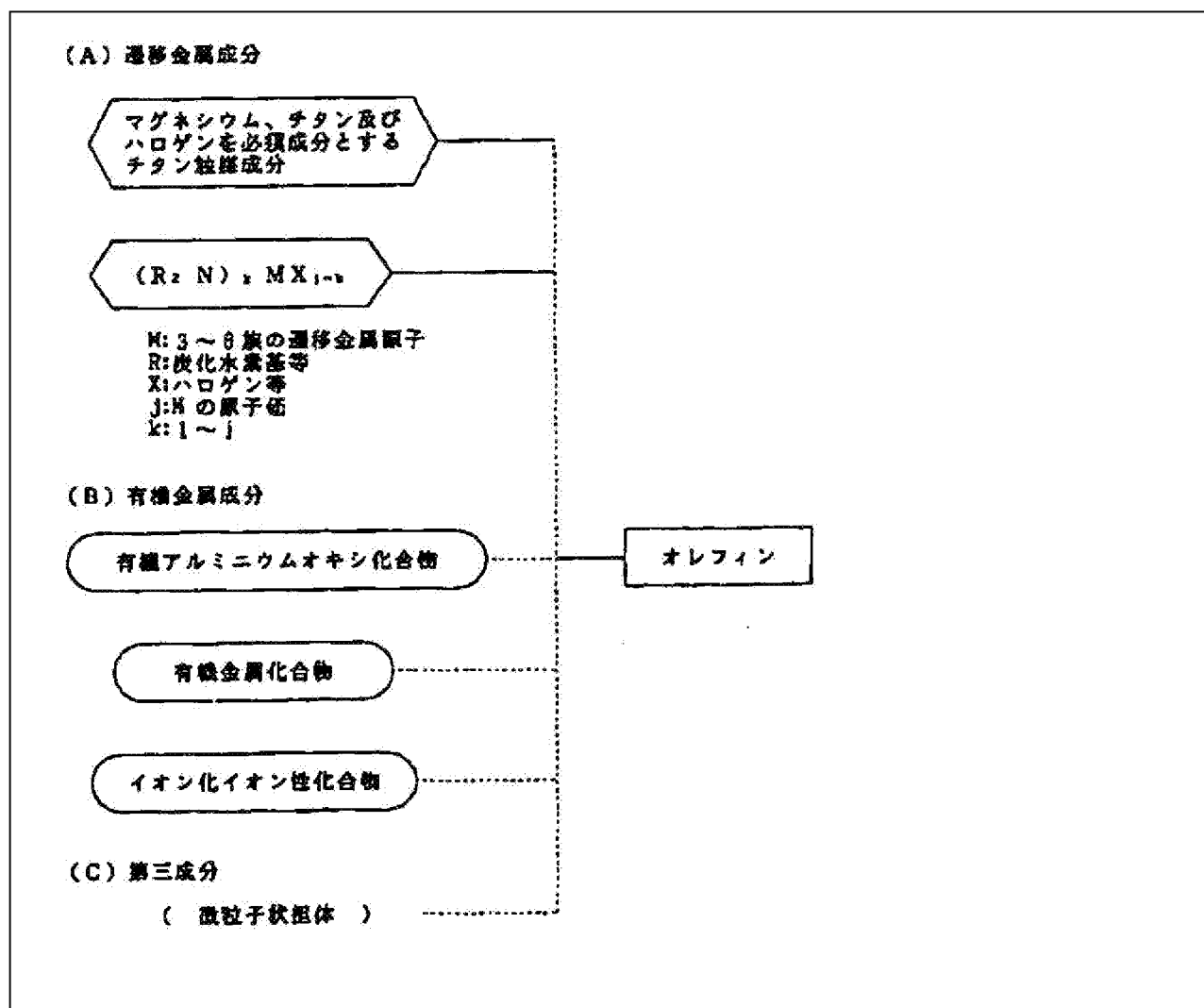
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nitrogen atoms. Further, Sugimura et al. (JP 10-330416, page 21, line 4) clearly teach that the  $R^1$  to  $R^{10}$  hydrocarbyl groups can include hydrogen, methyl or propyl groups.



Regarding the claimed “hafnium”, Sugimura et al. (abstract, figure) clearly indicate that the recited metal M can include the claimed “hafnium”.





8. Claims 1, 7-10, 12, 15, 17, 19-21, 49 are rejected under 35 U.S.C. 102(b) as being anticipated by Imuta et al. (WO 98/34961).

Imuta et al. (abstract) disclose an olefin polymerization process comprising a catalyst that is substantially identical to the catalyst as claimed. Further, Imuta et al. (abstract) disclose that the polymerization process is a slurry process with aliphatic or

alicyclic hydrocarbon. Since Imuta et al. contain all the features of claims 1, 7-10, 12, 15, 17, 19-21, 49, claims 1, 7-10, 12, 15, 17, 19-21, 49 are anticipated.

Regarding the new claim 49, Imuta et al. (page 51) disclose a catalyst structure where M can include the "hafnium" metal as claimed. Regarding the claimed alkylene group in between A and N atoms, Imuta et al. (page 4-5) clearly teach the embodiment as claimed.

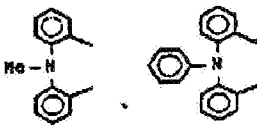
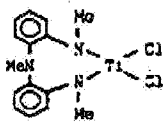
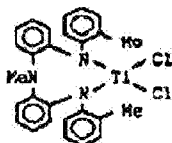
9. Claims 1, 7-10, 12, 15, 17, 19-21, 49 are rejected under 35 U.S.C. 102(e) as being anticipated by Imuta et al. (US 6,255,419).

Imuta et al. (abstract) disclose an olefin polymerization process comprising a catalyst that is substantially identical to the catalyst as claimed. Further, Imuta et al. (col. 80, line 27-32) disclose that the polymerization process is either a liquid phase polymerization process including solution polymerization and suspension polymerization, or gas phase polymerization. Since Imuta et al. contain all the features of claims 1, 7-10, 12, 15, 17, 19-21, 49, claims 1, 7-10, 12, 15, 17, 19-21, 49 are anticipated.

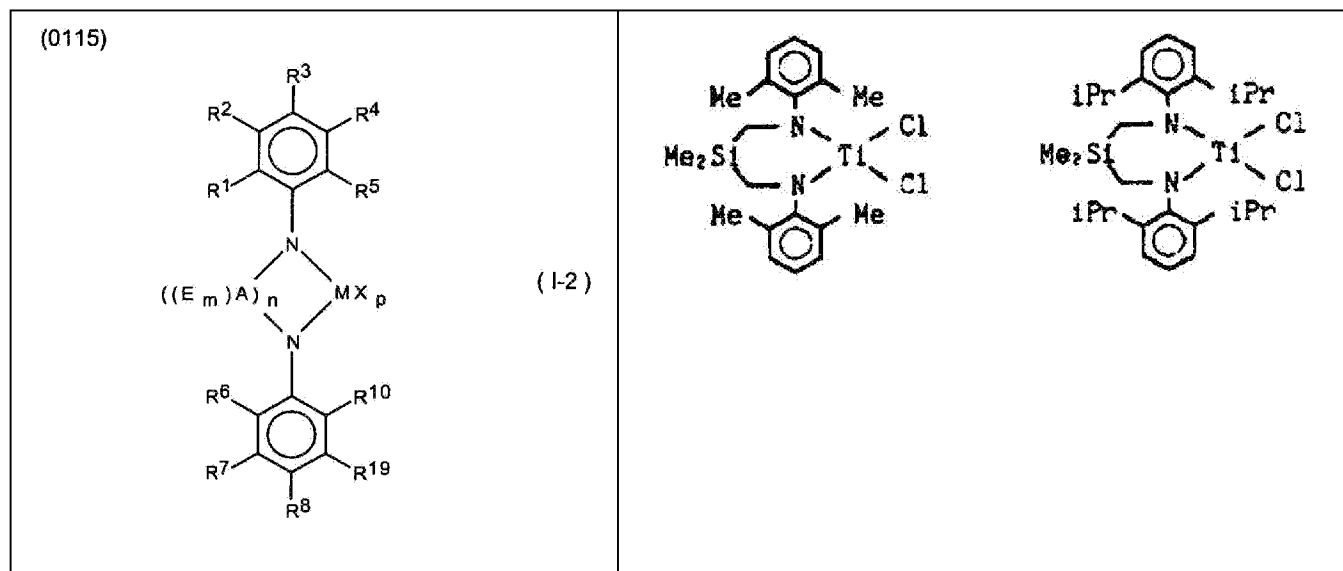
Regarding the new claim 49, Imuta et al. (Figure 1) disclose a catalyst structure where M is a Group 4 transition metal that includes the "hafnium" metal as claimed. Regarding the claimed alkylene group in between A and N atoms, Imuta et al. (col. 2, line 58 to col. 3, line 46) clearly teach the embodiment as claimed.

### ***Response to Arguments***

10. Applicant's arguments filed April 8, 2008 have been fully considered but they are not persuasive. Applicants argue Sugimura et al. (JP 10-330412) and the other equivalent art cited do not disclose the invention being claimed because they are directed to ligands (see the following table) that are not being claimed.

 <p>(See numbered paragraph (0104));</p>	 <p>(See numbered paragraph (0112), page 37 of JP-412.)</p>
	 <p>(See numbered paragraph (0140), page 51 of JP-412.)</p>

However, the examiner disagrees. Applicants must recognize that Sugimura et al. (JP 10-330412, page 38, 49) clearly disclose that catalyst can be as follow, where the A can be nitrogen instead of a silicon atom (JP 10-330412, page 33, 0098) and the catalyst can comprise alkylene groups between the recited A and nitrogen atoms (JP 10-330412, page 38, 49).



Regarding the hafnium catalyst of claim 49, applicants must recognize that Sugimura et al. (JP 10-330412, page 32, 0092-0094; page 38, 0115-0118) clearly teach catalysts that include hafnium where R<sup>1</sup>-R<sup>10</sup> can be hydrogen or hydrocarbyl groups. According to Sugimura et al. (JP 10-330412, page 38, 49), R<sup>1</sup>-R<sup>10</sup> can include hydrogen, methyl and propyl groups.

Therefore, the examiner has a reasonable basis to maintain the rejection set forth.

### Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William K Cheung whose telephone number is (571) 272-1097. The examiner can normally be reached on Monday-Friday 9:00AM to 2:00PM; 4:00PM to 8:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David WU can be reached on (571) 272-1114. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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/William K Cheung/

Primary Examiner, Art Unit 1796

William K. Cheung, Ph. D.

Primary Patent Examiner

June 19, 2008